PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

Tom Thuan CHEUNG

Appln. No. 09/364,315

Confirmation No. 9277

Filed: July 30, 1999

For: MULTI-CONNECTION CONTROL SYSTEM

Docket No. A8491

Group Art Unit: 2142

Examiner: Hai V. NGUYEN

SUBMISSION OF APPELLANT'S BRIEF ON APPEAL

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith please find an original and two copies of Appellant's Brief on Appeal. A check for the statutory fee of $330.00 is attached. The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account. A duplicate copy of this paper is attached.

Respectfully submitted,

Billy Carter Raulerson

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Billy Carter Raulerson
Registration No. 52,156

Date: January 16, 2004

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APPELLANT'S BRIEF ON APPEAL UNDER 37 C.F.R. § 1.192

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 37 C.F.R. § 1.192, Appellant submits that the following comprises the Appellant's Brief on Appeal from the Office Action dated August 19, 2003 and the Advisory Action dated November 10, 2003, wherein claims 1-2, 4-12, 14-22, 24-33, 36-40 and 43-55 were finally rejected. This Appeal Brief is being filed in triplicate and is accompanied by a Submission which includes the required appeal fee set forth in 37 C.F.R. § 1.17(c). Appellants' Notice of Appeal was filed on November 19, 2003. Therefore, the present Appeal Brief is timely filed.

I. REAL PARTY IN INTEREST

The real party in interest is International Business Machines Corporation ("IBM") of Armonk, New York, the Assignee.

II. RELATED APPEALS AND INTERFERENCES

Upon information and belief, there are no other appeals or interferences known to Appellant, Appellant's representatives or the Assignee that will directly affect or be directly affected by, or have a bearing on, the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 1-2, 4-12, 14-22, 24-33, 36-40 and 43-55 (*see* attached Appendix) are the claims currently on appeal, from the final rejections set forth in the Office Action dated August 19, 2003 and the Advisory Action dated November 10, 2003.

IV. STATUS OF AMENDMENTS

By way of overview, the present application was filed on July 30, 1999. The application was filed with claims 1-30. Claims 31-44 were added in an Amendment Under 37 C.F.R. § 1.111 filed on August 14, 2003. Claims 45-49 were added in an Amendment Under 37 C.F.R. § 1.111 filed on January 29, 2003. Claims 50-55 were added in an Amendment Under 37 C.F.R. § 1.111 on July 1, 2003.

Furthermore, Appellant files an Amendment Under 37 C.F.R. § 1.116, concurrently herewith, in which claims 3, 13, 23, 34-35 and 41-42 are placed in condition for allowance. Since the Amendment is being filed concurrently with this Appeal Brief, it has not yet been entered. However, Appellant respectfully requests that the Examiner enter the Amendment as it will substantially narrow the issues on appeal.

V. SUMMARY OF THE INVENTION

The present invention is directed to an improved technique for accessing a server to process multiple requests (page 1, lines 7-18). For example, Appellant's invention is consistent

with a multi-connection control system that is a connection provider to a server that enables multiple accesses by multiple requests simultaneously (page 5, lines 22-24). The multi-connection control system is dynamic in that the number of requests to access the system may be increased without interrupting the system (page 6, lines 1-4). Thus, the multi-connection control system is an access system that controls access to the server (page 6, lines 12-13). Herein, "access to the server" refers to connecting to the server to initiate requests to the server (page 6, lines 13-14).

As illustrated in Fig. 2, the multi-connection control system, *i.e.*, access system 200, includes an access function 202 that determines whether or not access is to be provided (page 6, lines 15-20). The access function 202 makes its determination using an access vector 204 (*Id.*). The access vector 204 is, for example, an array of access objects 206 (*Id.*).

The access objects 206 are specified based on the access system 200 (page 6, lines 21-27). For example, in a badge-based system wherein a badge is required to enter a set of rooms, the badge is the access object, *i.e.*, the badge is modeled by the access object (*Id.*). The access object 206 includes enough information (attributes) to determine valid access, *i.e.*, whether or not a request is authorized, and other access rights (*Id.*). The access vector 204 controls the uniqueness of the access and may be stored in a shared memory storage for use by multiple requests (*Id.*). In this manner, the access vector 204 is shared among multiple users of one system or among multiple systems (page 8, lines 14-15).

As noted above, the access function 202 is used to manipulate the access vector 204 to determine whether or not access is available (page 7, lines 1-6). If access is available, the access

system 200 returns the necessary confirmation to the request; otherwise, the access system 200 returns a predetermined "no access" value (*Id.*).

Furthermore, new access objects 206 can be added to the access vector 204 in order to allow more requests for access to the server without stopping the access system 200 (page 9, lines 7-19). In this manner, once an administrator increases the number of requests or updates the access level of a particular request, the request can access the system (*Id.*). Similarly, the number of requests that can simultaneously access the system may be decreased (*Id.*).

Because the logic that is to be applied to determine whether access is available is easily fitted into the access function 202, Appellant's invention presents a generalized technique that enables different access systems with varying characteristics (*e.g.*, badge systems, parking systems, server systems, etc.), to have different access functions (page 10, lines 3-5). Additionally, separation of the access logic from a complex system to which it is applied reduces the complexity of the overall system (page 10, lines 6-7).

Furthermore, the access system 200 restricts access to an access function, thus minimizing the amount of information that a request "needs to know" (page 10, lines 7-10). In this manner, a request may input its request without understanding the logic of the access function (*Id.*).

Another advantage of the access system 200 is that it provides synchronization (page 10, lines 11-15). In other words, the access function is being synchronized among multiple requests or even multiple systems, each with multiple requests (*Id.*). To maintain this synchronization,

the access vector is manipulated one thread at a time (*Id.*). In this manner, the access vector is locked and cannot be accessed by others while one thread is manipulating the access vector (*Id.*).

VI. ISSUE

The issue on appeal relates to whether or not claims 1-2, 4-12, 14-22, 24-33, 36-40 and 43-55 are patentable over a reasonable combination, if any, of Heath et al., U.S. Patent No. 5,553,239 (hereinafter "Heath") in view of Jones et al., U.S. Patent No. 6,282,561 (hereinafter "Jones"), under 35 U.S.C. § 103(a).

VII. GROUPING OF CLAIMS

The claims do not stand or fall together and arguments for the patentability of each group of claims, identified below, are set forth in Section VIII of this brief.

Group I: claims 1-2, 4-5, 9, 11-12, 14-15, 19, 21-22, 24-25 and 29, each of which stand or fall together.

Group II: claims 6-8, 16-18, 26-28, 36-37 and 43-44, each of which stand or fall together.

Group III: claims 10, 20, 30-33 and 38-40, each of which stand or fall together.

Group IV: claims 45-49, each of which stand or fall together.

Group V: claims 50-55, each of which stand or fall together.

VIII. ARGUMENTS

Appellant respectfully requests the Board to reverse the Examiner's rejections of the claims pending in the application for at least the following reasons.

1. Claims 1-2, 4-12, 14-22, 24-33 And 43-55 Art Patentable Over Heath And Jones

Claims 1-2, 4-12, 14-22, 24-33 and 43-55 are patentable over a reasonable combination, if any, of Heath and Jones for at least the following reasons.

A. Claims 1-2, 4-5, 9, 11-12, 14-15, 19, 21-22, 24-25 and 29 (Group I) Are Patentable Over Heath And Jones

Claim 1 recites, *inter alia*, the step of "for each request [to access a system], determining whether to allow access to the system using an access vector to identify an available access object" (*see also* claims 11 and 21). The Examiner acknowledges that Heath fails to teach or suggest these features of claim 1. However, the Examiner alleges that Jones makes up for the acknowledged deficiencies of Heath.

To the contrary, Jones does not relate to controlling the allowance of access to a system, much less allowing access by using an access vector or identifying an available access object. Instead, Jones relates to a resource management mechanism for arbitrating resource requests and resource usage among independent real-time applications programs that run simultaneously on one or more machines (Jones: col. 4, lines 9-13). Consequently, Jones does not teach and cannot possibly suggest the step of "for each request, determining whether to allow access to the system using an access vector to identify an available access object", as recited in claim 1 (*see also* claims 11 and 21).

In Jones, a resource is a limited hardware or software quantity that is provided by a machine, for example, CPU time, memory capacity, I/O bus bandwidth, network bandwidth, video frame buffers, sound cards, etc. (Jones: col. 4, lines 35-39). In Jones, an activity (*i.e.*, a running program), which is aware of its resource requirements, submits a request for resources in

specified amounts to a resource planner (Jones: Abstract). The resource planner is a program that arbitrates access to the resources of a machine amongst different activities (Jones: col. 4, lines 63-64). The resource planner, which is knowledgeable about all local resources, tells an activity what amount of a resource, if any, is reserved for use by the activity (Jones: col. 4, lines 64-67).

The resource planner determines whether the activity should be granted the requested (resource) reservation by employing an internal policy module that implements a policy (Fig. 6A of Jones illustrates the policy) for arbitrating amongst requests to reserve resources (Jones: col. 1, lines 42-26). When denying a request, the resource planner may inform the activity of what quantity of the requested resources are currently available so that the activity may submit a modified request (Jones: Abstract).

The Examiner alleges that the request from a running program for specified amounts of resources needed by the running program to exhibit predictable behavior, as described in Jones, corresponds to the "request to access a system", recited in claim 1 (*see also* claims 11 and 21). However, it is respectfully submitted that the running program's request for specified amounts of resources is not a request to access the system but rather to have resources allocated to it.

For example, in Jones, if a running program requires 10 seconds of CPU time, the program sends a request for 10 seconds of CPU time to the resource planner. The resource planner then determines whether or not the requested 10 seconds of CPU time is available, and if it is, the resource planner grants the program the 10 seconds of CPU time. This management of system resources, as described in Jones, does not teach or suggest using an access vector to

identify an available access object in order to determine whether to allow access to a system (*see* claims 1, 11 and 21).

Furthermore, Jones does not describe identifying "an available access object", as recited in claim 1 (*see also* claims 11 and 21). In claim 1, an access vector identifies an available access object in order to determine whether to allow access to the system (*see also* claims 11 and 21). The Examiner alleges that the "resource set" of Jones, which is implemented as an object, teaches the recited available access object (Jones: col. 7, line 13 to col. 8, line 40). To the contrary, a resource set specifies what resources, and in what quantity, are required by the requesting activity (Jones: col. 7, lines 42-45).

Since the resource set of Jones is a component of each request for resources from an activity, it does not correspond to the recited available access object. In Jones, every resource request will include a resource set, and thus, unlike the access object of claim 1 (*see also* claims 11 and 21), a resource set cannot be available or unavailable. Indeed, Jones does not describe any concept of availability/unavailability of a resource set. Instead, a resource set is merely a collection of data (*i.e.*, a number of pairs of resources and resource amounts) that is used by an activity to request resources (Jones: col. 7, lines 38-59).

Further still, the Examiner fails to provide any reasonable suggestion or motivation, from the references themselves or the knowledge generally available to one of ordinary skill in the art at the time of Appellant's invention, and without the use of impermissible hindsight, for combining Heath and Jones.

Heath describes a server architecture for connecting to a plurality of remote client computers, each seeking access to applications resident on the server (Heath: Abstract). Heath describes granting a connection to a client by using conventional username/password authentication and validating requests for access to an application program based upon a subscriber privilege level associated with the client (Heath: claims 1-3). Heath does not relate to managing the allocation of the resources of a machine.

Disparately, Jones describes a resource management mechanism for ensuring that real-time application programs running on a single machine or a set of machines exhibit predictable behavior (Jones: Abstract). To this end, a resource planner is provided in the computer system for planning allocation of the resources of a machine (Jones: col. 1, lines 37-50). The resource planner includes a policy module for implementing a policy for arbitrating amongst requests to reserve resources (*Id.*).

Thus, Heath and Jones are fundamentally different and the Examiner fails to provide a reasonable suggestion, absent the use of impermissible hindsight, for combining their teachings.

For at least the above exemplary reasons, claims 1, 11 and 21 are not rendered obvious by a reasonable combination, if any, of Heath and Jones.

Consequently, claims 2, 4-5, 9, 12, 14-15, 19, 22, 24-25 and 29 are patentable over Heath and Jones, at least by virtue of their respective dependency from claims 1, 11 and 21.

B. Claims 6-8, 16-18, 26-28, 36-37 And 43-44 (Group II) Are Patentable Over Heath And Jones

Claim 6 recites, *inter alia*, the step of "modifying the access vector to modify a number of access objects" (*see also* claims 7-8, 16-18, 26-28, 36-37 and 43-44). According to claim 6, the access vector is modified to change a number of access objects comprising the access vector. For example, the number of access objects in the access vector can be increased (*see* claims 7, 17, 27, 36 and 43). Likewise, the number of access objects in the access vector can be decreased (*see* claims 8, 18, 28, 37 and 44). By changing the number of access objects in the access vector, the number of simultaneous accesses to the system are correspondingly changed. The Examiner alleges Jones teaches the features of this modifying step (*citing* Jones: Abstract; and col. 10, lines 33-55).

To the contrary, Jones describes that if a resource reservation for an input resource set is not granted, a resource set is passed out that specifies the amount of available resources of the type asked for (Jones: col. 10, lines 35-42). Then, based on this quantity of requested resources that are currently available, a modified request for resource reservation can be submitted (Jones: Abstract).

For example, if a running program's request for 10 seconds of CPU time is not granted, an indication that 8 seconds of CPU time is currently available may be provided to the running program. Then, the running program can modify its original request for 10 seconds of CPU time to be a request for 8 seconds of CPU time. Thus, in Jones, a request for a reservation of a set of resources in a first amount can be changed to a request for a reservation of a set of resources in a

second amount based on the returned list of amounts of the set of resources that are currently available (Jones: col. 2, lines 31-37).

Changing the amount of resources requested to be reserved based on the amount of resources currently available in a system does not correspond to modifying an access vector to modify a number of access objects (*see* claims 6-8, 16-18, 26-28, 36-37 and 43-44). Indeed, in the aforementioned example, changing the request for 10 seconds of CPU time to a request for 8 seconds of CPU time does not in any way relate to modifying an access vector, which is used to determined whether or not to allow access to a system.

Thus, Jones fails to teach or suggest the step of "modifying the access vector to modify a number of access objects", as recited in claim 6 (*see also* claims 7-8, 16-18, 26-28, 36-37 and 43-44).

Further still, Jones fails to teach or suggest modifying the access vector to increase the number of access objects (*see* claims 7, 17, 27, 36 and 43) and modifying the access vector to decrease the number of access objects (*see* claims 8, 18, 28, 37 and 44). By increasing the number of access objects in the access vector, the number of simultaneous accesses permitted to the system is expanded (*see* claims 7, 17, 27, 36 and 43). Conversely, by decreasing the number of access objects in the access vector, the number of simultaneous accesses permitted to the system is reduced (*see* claims 8, 18, 28, 37 and 44).

The modification of a resource reservation in Jones, as described above, does not correspond to increasing/decreasing the number of access objects in an access vector, wherein the access vector is used to determined whether or not to allow access to a system. For example,

changing a reservation request for a specified amount of resources, *e.g.*, 10 seconds of CPU time, by decreasing the requested amount to 8 seconds of CPU time, does not correspond to decreasing a number of access objects in an access vector that is used to determine whether or not to allow access to a system.

Indeed, Jones does not describe increasing/decreasing the number of access objects in an access vector to increase/decrease (respectively) the number of simultaneous accesses permitted to a system. Instead, the resource management mechanism of Jones is provided to ensure that real-time application programs running on a single machine or a set of machines exhibit predictable behavior (Jones: Abstract).

Heath fails to make up for the exemplary deficiencies of Jones, as set forth above. Consequently, claims 6-8, 16-18, 26-28, 36-37 and 43-44 are patentable over a reasonable combination, if any, of Heath and Jones.

C. Claims 10, 20, 30-33 And 38-40 (Group III) Are Patentable Over Heath And Jones

Claim 10 recites the step of "allowing one request at a time to manipulate the access vector" (*see also* claims 20, 30-31 and 38). As noted above, one of the advantages of the claimed invention is that it provides synchronization in that the access function is being synchronized among multiple requests or even multiple systems, each with multiple requests (page 10, lines 11-13). For example, to maintain this synchronization, manipulation of the access vector can be limited to one thread at a time (page 10, lines 13-14). In this manner, the access vector can be locked and other threads cannot manipulate the access vector while any one thread is manipulating the access vector (page 10, lines 14-15).

The Examiner alleges that Jones teaches the features of this allowing step (*citing* Jones: col. 1, line 36 to col. 3, line 27). To the contrary, as noted above, Heath and Jones (alone or in combination) fail to teach or suggest an access vector that is used to identify an available access object to determine whether or not to allow (simultaneous) access to a system. Therefore, Heath and Jones (alone or in combination) fail to teach and cannot possibly suggest allowing only one request at a time to manipulate the access vector (*see* claims 10, 20, 30-31 and 38). Indeed, both Heath and Jones fail to describe any "locking" of an access vector.

For at least the above exemplary reasons, claims 10, 20, 30-31 and 38 are not rendered obvious by a reasonable combination, if any, of Heath and Jones. Consequently, claims 32-33 and 39-40 are patentable over Heath and Jones, at least by virtue of their dependency.

D. Claims 45-49 (Group IV) Are Patentable Over Heath And Jones

Claim 45 recites the step of "granting access to the system in response to identifying said available access object, wherein said available access object is unavailable for further use while said access is granted" (*see also* claims 46-49). According to claim 45, once one of possibly many simultaneous accesses is granted to the system, in response to identifying an available access object by use of an access vector, the identified access object becomes "unavailable" for further use for as long as the access is granted (*see also* claims 46-49).

The Examiner alleges that Jones teaches the features of this granting step (*citing* Jones: col. 2, line 12 to col. 3, line 27; and col. 11, lines 10-67). To the contrary, as noted above, Heath and Jones (alone or in combination) fail to teach or suggest an access vector that is used to identify an available access object to determine whether or not to allow (simultaneous) access to

a system. Therefore, Heath and Jones (alone or in combination) fail to teach and cannot possibly suggest that once access is granted to the system in response to identifying an available access object, the identified access object becomes unavailable for further use while the access is granted (*see* claims 45-49).

For at least the above exemplary reasons, claims 45-49 are not rendered obvious by a reasonable combination, if any, of Heath and Jones.

E. Claims 50-55 (Group V) Are Patentable Over Heath And Jones

Claim 50 recites that for each received request to access a system, "whether to allow access to the system using an access vector comprised of one or more access indicators, wherein a number of available access indicators corresponds to a number of simultaneous accesses permitted by the system at any given time" is determined (*see also* claims 52 and 54). Thus, the claimed invention relates to determining access to a system that permits a predetermined number of simultaneous accesses (*see* claims 50, 52 and 54).

For example and not by way of limitation, if the claimed invention were used to model access to a parking system, the access indicators might each represent a parking space. Therefore, the number of available access indicators would correspond to the number of simultaneous accesses permitted by the system at any given time, *e.g.*, the number of vehicles that could park in the parking system at any given time.

The Examiner alleges that Jones teaches the features recited in claims 50-55. Specifically, the Examiner (*citing* Jones: col. 9, line to col. 12, line 67) alleges that Jones describes determining whether to allow access to the system using an access vector (Jones:

resource planner) comprised of one or more access indicators (Jones: activity notifications to resource sets), wherein a number of available access indicators corresponds to a number of the simultaneous accesses permitted by the system as any given time.

To the contrary, the activity notifications to resource sets, as described in Jones, do not teach or suggest "a number of available access indicators corresponds to a number of the simultaneous accesses permitted by the system at any given time" (*see* claims 50, 52 and 54). Instead, Jones describes an interface that allows the resource planner to (1) tell an activity that it has consistently used more of a resource than it has reserved, (2) tell an activity that other activities need a set of resources more than it does and (3) tell an activity that additional resources have become available that it may wish to negotiate for (Jones: col. 11, lines 42-60). Through this interface, the reassignment of resource reservations can be realized by either direct resource provider action or by prompting renegotiations by lower importance activities (Jones: col. 11, lines 30-39). Thus, Jones fails to teach or suggest any one-to-one correspondence between these activity notifications and a number of simultaneous accesses permitted by the system at any given time.

Heath fails to make up for the exemplary deficiencies of Jones, as set forth above. Consequently, claims 50, 52 and 54 are not rendered obvious by a reasonable combination, if any, of Heath and Jones. Furthermore, claims 51, 53 and 55 are patentable over Heath and Jones, at least by virtue of their dependency.

In conclusion, Appellant respectfully requests the members of the Board to reverse the rejections of the appealed claims and to find each of the claims allowable as defining subject matter which is not unpatentable under 35 U.S.C. § 103(a).

The present Brief on Appeal is being filed in triplicate. Unless a check is submitted herewith for the fee required under 37 C.F.R. §1.192(a) and 1.17(c), please charge said fee to Deposit Account No. 19-4880.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

Billy Carter Raulerson
Registration No. 52,156

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: January 16, 2004

APPENDIX

CLAIMS 1-2, 4-12, 14-22, 24-33, 36-40 AND 43-55 ON APPEAL:[1]

1. A method of determining access, the method comprising the steps of:

receiving one or more requests to access a system; and

for each request, determining whether to allow access to the system using an access vector to identify an available access object.

2. The method of claim 1, wherein the access object comprises information regarding attributes of the access object.

4. The method of claim 1, further comprising the step of returning a result to the request.

5. The method of claim 1, further comprising the step of modifying the access vector upon receiving an indication that a request has completed its access to the system.

6. The method of claim 1, further comprising the step of modifying the access vector to modify a number of access objects.

7. The method of claim 6, wherein the number of access objects is increased.

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[1] Claims 3, 13, 23, 34-35 and 41-42 are not being appealed because they are placed in condition for allowance by the Amendment Under 37 C.F.R. § 1.116 being filed concurrently with this Appeal Brief.

8. The method of claim 6, wherein the number of access objects is decreased.

9. The method of claim 1, further comprising the step of modifying one or more attributes of an access object.

10. The method of claim 1, further comprising the step of allowing one request at a time to manipulate the access vector.

11. An apparatus for determining access, comprising:

a computer;

one or more computer programs, performed by the computer, for receiving one or more requests to access a system and, for each request, determining whether to allow access to the system using an access vector to identify an available access object.

12. The apparatus of claim 11, wherein the access object comprises information regarding attributes of the access object.

14. The apparatus of claim 11, further comprising means for returning a result to the request.

15. The apparatus of claim 11, further comprising means for modifying the access vector upon receiving an indication that a request has completed its access to the system.

16. The apparatus of claim 11, further comprising means for modifying the access vector to modify a number of access objects.

17. The apparatus of claim 16, wherein the number of access objects is increased.

18. The apparatus of claim 16, wherein the number of access objects is decreased.

19. The apparatus of claim 11, further comprising means for modifying one or more attributes of an access object.

20. The apparatus of claim 11, further comprising means for allowing one request at a time to manipulate the access vector.

21. An article of manufacture comprising a computer program carrier readable by a computer and embodying one or more instructions executable by the computer to perform method steps for determining access, the method comprising the steps of:

receiving one or more requests to access a system; and

for each request, determining whether to allow access to the system using an access vector to identify an available access object.

22. The article of manufacture of claim 21, wherein the access object comprises information regarding attributes of the access object.

24. The article of manufacture of claim 21, further comprising the step of returning a result to the request.

25. The article of manufacture of claim 21, further comprising the step of modifying the access vector upon receiving an indication that a request has completed its access to the system.

26. The article of manufacture of claim 21, further comprising the step of modifying the access vector to modify a number of access objects.

27. The article of manufacture of claim 26, wherein the number of access objects is increased.

28. The article of manufacture of claim 26, wherein the number of access objects is decreased.

29. The article of manufacture of claim 21, further comprising the step of modifying one or more attributes of an access object.

30. The article of manufacture of claim 28, further comprising the step of allowing one request at a time to manipulate the access vector.

31. A method of determining access, the method comprising:

receiving one or more requests to access a system; and

for each request, determining whether to allow access to the system using an access vector comprised of one or more access indicators, wherein only one request at a time uses the access vector.

32. The method of claim 31, wherein said access indicators contain information used to determine validity of the request for access.

33. The method of claim 32, wherein the information used to determine the validity includes an access level identifier and the validity of the request is determined based upon comparing an access level associated with the request with the access level identifier.

36. The method of claim 31, wherein the method further comprises manipulating the access vector to add an access indicator, thereby expanding the number of simultaneous accesses to the system.

37. The method of claim 31, wherein the method further comprises manipulating the access vector to remove an access indicator, thereby reducing the number of simultaneous accesses to the system.

38. An article of manufacture comprising a computer program carrier readable by a computer and embodying one or more instructions executable by the computer to perform method steps for determining access, the method comprising the steps of:

receiving one or more requests to access a system; and

for each request, determining whether to allow access to the system using an access vector comprised of one or more access indicators, wherein only one request at a time uses the access vector.

39. The article of manufacture of claim 38, wherein said access indicators contain information used to determine validity of the request for access.

40. The article of manufacture of claim 39, wherein the information used to determine the validity includes an access level identifier and the validity of the request is determined based upon comparing an access level associated with the request with the access level identifier.

43. The article of manufacture of claim 38, wherein the method further comprises manipulating the access vector to add an access indicator, thereby expanding the number of simultaneous accesses to the system.

44. The article of manufacture of claim 38, wherein the method further comprises manipulating the access vector to remove an access indicator, thereby reducing the number of simultaneous accesses to the system.

45. The method of claim 1, further comprising:

granting access to the system in response to identifying said available access object, wherein said available access object is unavailable for further use while said access is granted.

46. The apparatus of claim 11, further comprising:

one or more computer programs, performed by the computer for granting access to the system in response to identifying said available access object, wherein said available access object is unavailable for further use while said access is granted.

47. The article of manufacture of claim 21, the method further comprising:

granting access to the system in response to identifying said available access object, wherein said available access object is unavailable for further use while said access is granted.

48. The method of claim 31, further comprising:

granting access to the system in response to identifying said available access object, wherein said available access object is unavailable for further use while said access is granted.

49. The article of manufacture of claim 38, the method further comprising:

granting access to the system in response to identifying said available access object, wherein said available access object is unavailable for further use while said access is granted.

50. A method of determining access to a system, said system permitting a predetermined number of simultaneous accesses, the method comprising:

receiving one or more requests to access the system; and

for each request, determining whether to allow access to the system using an access vector comprised of one or more access indicators, wherein a number of available access indicators corresponds to a number of the simultaneous accesses permitted by the system at any given time.

51. The method of claim 50, further comprising for each request, granting access to the system if an available access indicator is found in said access vector.

52. An apparatus for determining access to a system, said system permitting a predetermined number of simultaneous accesses, the apparatus comprising:

a computer;

one or more computer programs, performed by the computer, for receiving one or more requests to access the system and, for each request, determining whether to allow access to the system using an access vector comprised of one or more access indicators, wherein a number of

available access indicators corresponds to a number of the simultaneous accesses permitted by the system at any given time.

53. The apparatus of claim 52, wherein for each request, access to the system is granted if an available access indicator is found in said access vector.

54. An article of manufacture comprising a computer program carrier readable by a computer and embodying one or more instructions executable by the computer to perform method steps for determining access to a system, said system permitting a predetermined number of simultaneous accesses, the method comprising:

receiving one or more requests to access the system; and

for each request, determining whether to allow access to the system using an access vector comprised of one or more access indicators, wherein a number of available access indicators corresponds to a number of the simultaneous accesses permitted by the system at any given time.

55. The article of manufacture of claim 54, the method further comprising for each request, granting access to the system if an available access indicator is found in said access vector.